Figure 4-29 shows the liquid level for the three annulus ENRAFs from January through August 2012. All three liquid level readings of the annulus ENRAFs were below the 0.25-in. specification except for two readings. Two readings were reported to be above 0.25 in. which occurred on July 24, 2012 and August 29, 2012 for ENRAF 152. It is assumed these were erroneous data points as levels returned to normal within hours.

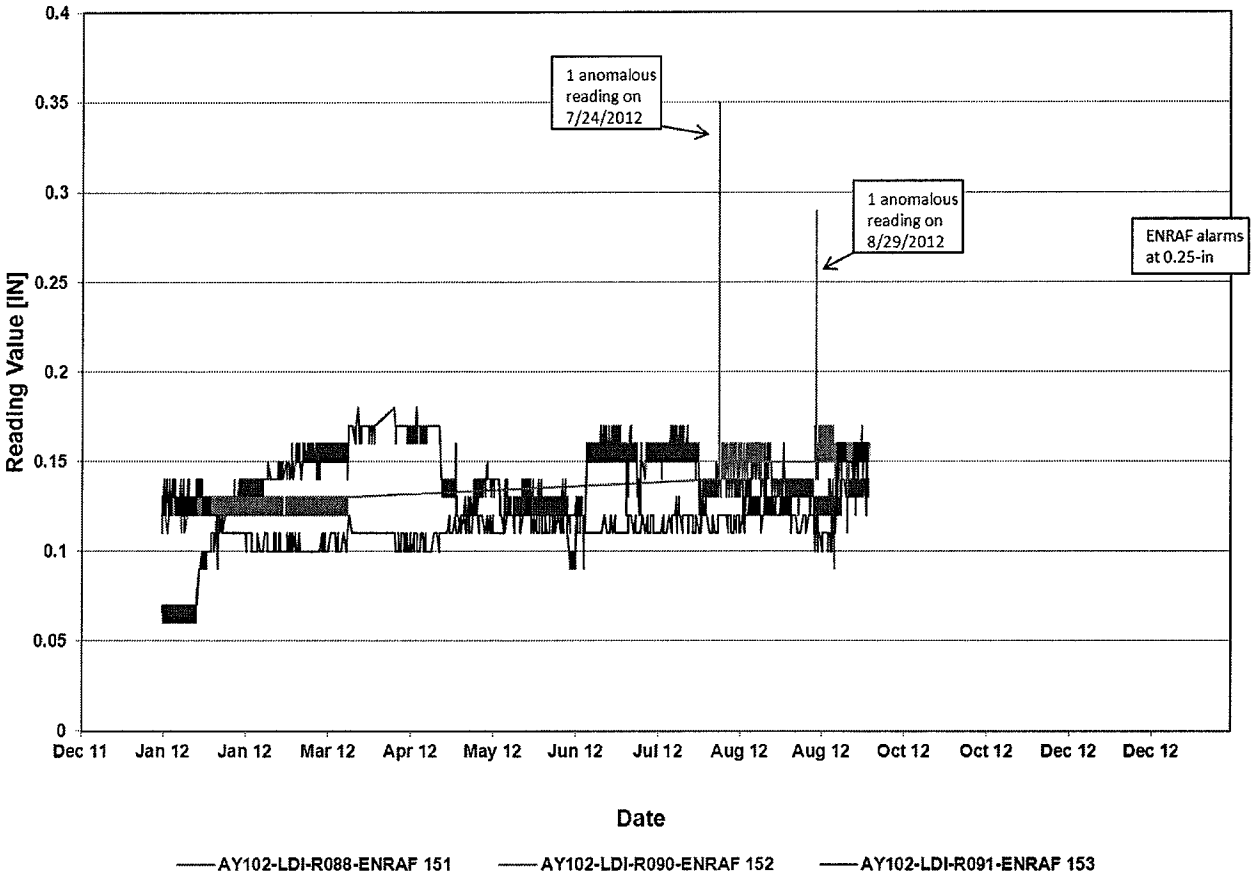

Figure 4-29. Tank AY-102 Annulus ENRAFs Liquid Levels 2012

4.2.4.3 Summary

The liquid level readings for the Tank AY-102 annulus ENRAFs were reviewed from 2004, when the ENRAFs were first installed, to present. There were no unexplained increases in liquid level data from 2004 until October 2011. In October 2011, ENRAF 152 alarmed as liquid levels gradually increased to a maximum level of 0.51 in. and then slowly declined to less than 0.25 in. by November 2011. Water intrusion from rainfall was the suspected cause; however, this explanation seems problematic because of the plummet radiation readings where none would be predicted.

4.2.4.4 Broken/Sticking ENRAF

On March 10, 2012, the Riser 90 ENRAF 152 was declared out of service. During planned repairs on May 24, 2012, the ENRAF displacer wire broke while attempting to retrieve the displacer and fell into the annulus of Tank AY-102 (see Section 4.4). A bullet camera was deployed into the annulus on June 4, 2012 which identified that the displacer was in a location

that would interfere with the performance of a replacement ENRAF. During this time, it was reported the drum and reel contamination readings were 20,000 dpm/100 cm^2. On June 5, 2012 attempts to retrieve the stuck ENRAF displacer were unsuccessful; thus, the displacer remains in the annulus floor debris as shown in Figure 4-30 (see Section 1.2.1).

Figure 4-30. Video of Tank AY-102 Annulus through Riser 87 Showing Broken ENRAF Displacer (August 30, 2012)

On July 24, 2012, the upper flange of the riser was rotated to avoid the displacer and debris on the annulus floor and a replacement ENRAF 152 drum and displacer were installed on Riser 90. The ENRAF was functionally tested and returned to service (TFC-WO-12-2156).

4.2.5 Continuous Air Monitor (Alarms and Decay Count)

4.2.5.1 Background

A new CAM airborne radioactivity monitoring and sampling system was installed on Tank AY-102 annulus exhaust in August 1975 (ARH-LD-208 B, *Atlantic Richfield Hanford Company Monthly Report August 1975*, page 11). The CAM system pulls a sample from the annulus exhaust duct through a filter paper. A radiation probe monitors the filter paper.